

1 CLAIMS

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3 1. A turnout for a railway track comprising a pair
4 of spaced apart rails, the turnout comprising a
5 raised track surface which is adapted to provide a
6 path along which the wheels of a train can travel
7 from one railway track to another, wherein the
8 raised track surface comprises first and second
9 portions and is arranged such that the wheels of the
10 train are first raised by the first portion to a
11 first rail crossing height and then lowered by the
12 second portion to a height at a location between the
13 pair of spaced apart rails of the railway track.

14

15 2. A turnout according to claim 1, wherein the
16 raised track surface is adapted such that the wheels
17 of the train are first raised to a rail crossing
18 height in order for a first wheel to cross a first
19 rail, then lowered to a height at a location between
20 the pair of spaced apart rails, then raised to the
21 rail crossing height in order for a second wheel to
22 cross the first rail, then preferably lowered to a
23 height at a location between the first and second
24 railway tracks.

25

26 3. A turnout according to either of claims 1 or 2,
27 wherein a pair of turnouts may be combined in order
28 to form a crossover adapted to allow a train to be
29 transferred from the first railway track to the
30 second.

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1 4. A turnout according to any preceding claim,
2 wherein a pair of crossovers may be used in
3 conjunction in order to allow a train to be
4 transferred from the first railway track to the
5 second railway track and back again to the first
6 railway track.

7

8 5. A turnout according to any preceding claim,
9 wherein the raised track surface is substantially
10 non-intrusive and the raised track surface is
11 provided with a supporting means to allow for
12 passage of trains.

13

14 6. A turnout according to any preceding claim,
15 wherein each first and second non-intrusive
16 crossovers comprise a pair of turnouts, and
17 preferably each pair of turnouts comprise a pair of
18 rails which form the raised track surface.

19

20 7. A turnout according to any preceding claim,
21 wherein each rail of the turnout further comprises
22 at least a ramp surface.

23

24 8. A turnout according to claim 7, wherein each
25 ramp surface is tapered from a short or no height
26 end to a relatively tall height end.

27

28 9. A turnout according to either of claims 7 or 8,
29 wherein each ramp surface comprises a linear taper
30 from the short or no height end to the relatively
31 tall height end which is of the same height as that
32 of the first rail crossing height.

1

2 10. A turnout according to any of claim 7 to 9,
3 wherein the relatively tall height end of the ramp
4 surface is adjacent to an end of the raised track
5 surface at its first rail crossing height, the two
6 combining to provide a path along which the wheel is
7 permitted to travel whilst maintaining a
8 substantially equal distance between a pair of
9 raised rails, which combined, form the raised track
10 surface.

11

12 11. A turnout according to any of claims 7 to 10,
13 wherein the ramp surface comprises a ramp for each
14 rail of the railway track, such that both ramps
15 incline substantially simultaneously, thereby
16 minimising differential levels in relation to the
17 respective rails.

18

19 12. A turnout according to any preceding claim,
20 wherein at least a crossing portion of each rail of
21 the raised track surface comprises a slot formed
22 therein below a rail head portion, wherein the slot
23 is arranged to lie over or around the rail being
24 crossed and the rail head portion is releasably
25 fixed to the said rail being crossed.

26

27 13. A turnout according to any preceding claim,
28 wherein at least a crossing portion of each rail of
29 the raised track surface comprises a railhead
30 portion arranged to lie over or around a supporting
31 member which in turn is arranged to lie over or
32 around the rail being crossed.

1

2 14. A turnout according to claim 13, wherein the
3 supporting member is arranged with its longitudinal
4 axis being parallel to the rails of the parent rail.

5

6 15. A turnout according to either of claims 13 or
7 14, wherein the supporting member comprises at least
8 an upper supporting member and at least a lower
9 supporting member.

10

11 16. A turnout according to claim 15, wherein the
12 upper supporting member is planar and has an upper
13 surface attached to a lower surface of the crossing
14 portion of the raised track.

15

16 17. A turnout according to either of claims 15 or
17 16, wherein at least a portion of the raised track
18 surface is supported by the parent rail and a fixing
19 means.

20

21 18. A turnout according to any of claims 15 to 17,
22 wherein the upper supporting planar member is
23 substantially wider than an existing rail of one of
24 the first and second railway tracks.

25

26 19. A turnout according to any of claims 15 to 18,
27 wherein the upper supporting planar member comprises
28 a rectangular plate.

29

30 20. A turnout according to any of claims 15 to 19,
31 wherein a pair of guide means are provided along at

1 least a portion of the upper supporting member's
2 length.

3

4 21. A turnout according to claim 20, wherein the
5 guide means run parallel to the upper supporting
6 member's longitudinal axis and project downwardly in
7 order, in use, to straddle an existing rail of the
8 first and second existing railway tracks.

9

10 22. A turnout according to any of claims 15 to 21,
11 wherein a pair of lower supporting members are
12 provided at either side of at least a portion of the
13 existing rail.

14

15 23. A turnout according to claim 22, wherein the
16 pair of lower supporting members combine to provide
17 a substantially similar shape, width and position
18 along the existing railway track as the upper
19 supporting member, and are adapted to be releasably
20 engaged thereto and releasably fixed thereto,
21 wherein the lower surface of the upper supporting
22 planar member lies on top of the uppermost surface
23 of the lower supporting members.

24

25 24. A turnout according to claim 23, wherein the
26 upper supporting member is moveably coupled to at
27 least one of the lower supporting members by a hinge
28 means.

29

30 25. A turnout according to claim 24, wherein the
31 upper supporting member may be moved from the first
32 to the second configuration by rotating the upper

1 supporting member about the hinge means relative to
2 the lower supporting member.

3

4 26. A turnout for a railway track comprising a pair
5 of spaced apart rails, the turnout comprising a
6 raised track surface which is adapted to provide a
7 path along which the wheels of a train can travel
8 from one railway track to another, wherein the
9 raised track surface comprises a crossing rail
10 portion adapted to cross over one of the spaced
11 apart rails, the crossing rail portion being coupled
12 to an upper supporting member which, in use, rests
13 upon and is supported by at least one lower
14 supporting member, characterised in that the upper
15 and at least one lower supporting members are
16 coupled to one another by a moveable mechanism.

17

18 27. A turnout according to claim 26, wherein there
19 a pair of lower supporting members are provided
20 which combine to provide a substantially similar
21 shape, width and position along the existing railway
22 track as the upper supporting member and the upper
23 supporting member comprises a substantially planar
24 member and the lower surface of the upper supporting
25 planar member lies on top of the uppermost surface
26 of the lower supporting members.

27

28 28. A turnout according to either of claims 26 or
29 27, wherein the moveable mechanism comprises a hinge
30 mechanism arranged to permit the upper supporting
31 member to move between a first configuration in
32 which the upper supporting member is arranged in a

1 substantially horizontal plane and rests upon the
2 pair of lower supporting members over the existing
3 rail of the railway track and a second configuration
4 in which the upper supporting member is remote from
5 the existing rail such that a train wheel may be
6 driven along the existing rail in normal running.

7

8 29. A turnout according to any of claims 26 to 29,
9 wherein the upper supporting member is moved from
10 the first to the second configuration by rotating
11 the upper supporting member about the hinge means
12 relative to the lower supporting member.

13

14 30. A turnout according to any of claims 26 to 30,
15 wherein normal running of a train along the first
16 and/or second existing railway track(s) is
17 selectively allowed, where the train does not travel
18 between the first and second existing railway tracks
19 by moving or removing one or more sections of the
20 crossover from engagement with the first and/or
21 second existing railway tracks.

22

23 31. A turnout according to claim 30, wherein the
24 one or more moveable or removable sections comprise
25 at least a ramp, a first raised portion of the
26 raised track surface, at least an upper supporting
27 member, and leaving in place the second lower
28 portion of the raised track surface, and selectively
29 includes at least one of the lower supporting
30 members left in place.

31

1 32. A turnout according to any preceding claim,
2 wherein the raised track surface comprises a
3 plurality of rail members, one or more of which
4 comprise a curved radius away from one of the
5 railway tracks towards the other railway track.

6

7 33. A turnout according to claim 32, wherein the
8 plurality of rail members combine to form a turnout
9 having a substantially continuous rail surface and
10 includes the following components:-

11 the said first portion which includes a ramp
12 member adapted to raise the train wheel to the rail
13 crossing height;

14 a curved radius rail adapted to urge the train
15 away from one of the railway tracks towards the
16 other railway track;

17 the second portion which includes a further
18 ramp member adapted to lower the train wheel to a
19 lower height at a location in between the pair of
20 spaced apart rails of the railway track;
21 another first portion which includes a further ramp
22 member to raise the train wheel from the lower
23 height to a rail crossing height; and

24 a crossover rail adapted to allow the train to
25 pass over an inner rail of the first existing
26 railway track at the raised height.

27

28 34. A turnout according to claim 33, wherein the
29 turnout further comprises another second portion
30 which includes a further ramp member adapted to
31 lower the train wheel to a lower height at a

1 location between the inside rails of the first and
2 second railway tracks.

3

4 35. A turnout according to either of claims 33 or
5 34, wherein at least a portion of the raised track
6 surface is supported in the lateral and or vertical
7 direction at a plurality of locations along its
8 length by a support device.

9

10 36. A turnout according to claim 35, wherein the
11 support device comprises a plurality of sleeper
12 supports and more preferably comprises a plurality
13 of pot sleeper arrangements.

14

15 37. A turnout according to any of claims 33 to 36,
16 wherein the one or more turnouts are temporary
17 turnouts non-intrusive turnouts.

18

19 38. A turnout for a railway track comprising a pair
20 of spaced apart rails, the turnout comprising a
21 raised track surface which is adapted to provide a
22 path along which the wheels of a train can travel
23 from one railway track to another, wherein the
24 raised track surface comprises a ramp member to
25 permit a wheel of a train to enter the raised track
26 surface, the ramp member comprising:-

27 a fixing mechanism to releasably secure the
28 ramp member to one of the spaced apart rails;

29 an upper ramp surface which in use provides a
30 rail surface for a tread of the wheel to traverse;

31 and

1 a lead-in portion which is arranged at one side
2 of the said one of the spaced apart rails, wherein
3 the lead-in portion comprises an upper rail surface
4 which, in use, is inclined at an angle to the
5 horizontal axis and which provides a rail surface
6 for a portion of the tread to traverse.

7

8 39. A turnout according to claim 38, wherein the
9 upper rail surface of the lead-in portion is
10 arranged to lie at one side of the said one of the
11 spaced apart rails and has an outermost end which is
12 arranged to be located at a height lower than the
13 upper rail surface of the said one of the spaced
14 apart rails and an innermost end which merges into
15 the rest of the upper rail surface of the ramp
16 member.

17

18 40. A turnout according to either of claims 38 or
19 39, wherein the portion of the ramp member which
20 merges from the lead-in portion to the rest of the
21 upper rail surface is also arranged at an angle
22 between the transverse direction of the rail surface
23 and the longitudinal axis of the rail surface.

24

25 41. A method of transferring a train from one
26 railway track comprising a pair of spaced apart
27 rails to a second railway track comprising a pair of
28 spaced apart rails, the method comprising the steps
29 of:-

30 providing a raised track surface having a first
31 portion which comprises a raised portion and a
32 second portion which comprises a lower portion

1 provided at a location between the spaced apart
2 rails of the railway track, where the raised track
3 surface is adapted to provide a path along which the
4 wheels of the train can travel from the first to the
5 second railway track;

6 driving the train along the first track and
7 onto the raised track surface, wherein the first
8 raised portion of is of a sufficient height such
9 that the wheels of the train are arranged to clear
10 the pair of spaced apart rails of the railway track;
11 and

12 continuing to drive the train onto the second lower
13 portion of the raised track surface.

14

15 42. Apparatus for facilitating Single Line Working
16 on a second railway track to clear a first railway
17 track for maintenance or other purposes, the
18 apparatus comprising a first non-intrusive crossover
19 and a second non-intrusive crossover being spaced
20 apart from the first non-intrusive crossover in the
21 direction of the longitudinal axis of the pair of
22 railway tracks, and which provide an undulating path
23 along which wheels of a train can travel from the
24 first to the second railway track and from the
25 second to the first railway track characterised in
26 that the non-intrusive crossovers comprise removable
27 portions and fixed portions and the undulating path
28 is adapted such that said fixed portions do not
29 project above a specified vertical height above the
30 first or second railway tracks.